AVT Marlin IEEE 1394 Digital Camera

Go digital!
It´s never been so easy to get into it.

ALLIED
Vision Technologies

The AVT Marlin family.

Go digital! It´s never been so easy to get into it.

Entry into the world of digital image processing has never been as simple and cost-effective before. With the new MARLIN, Allied Vision Technologies presents a whole series of attractive digital camera entry-level models of the FireWire™ category. Five different cameras, available in monochrome and color, complete a program which contains

a large selection of different resolutions and high-end specifications. In this price class, the Marlin is practically without an equal and offers sound arguments for anyone wishing to switch from analog to digital technology.

FireWire™ - the new standard in image processing.

The digital connective technology, introduced to the computer industry as early as 1994 by Apple, is now taking over the world of industrial image processing. The IEEE 1394 (FireWire™ or I-Link™) industry standard enables the simplest computer compatibility and bi-directional data transfer via Plug&Play. The savings potentials enabled by the technology, high data rates of 400 Mbit/s, the remarkable image quality and simple integration with existing applications result in FireWire cameras becoming more and more popular.

The MARLIN family at a glance.

The AVT Marlin family consists of five very compact IEEE 1394 C-mount cameras, which are equipped with highly sensitive high-quality sensors (CCD, CMOS). Each of these cameras is available in black/white as well as in color. The cameras, operating in 8-bit mode, impress in almost any situation by their ability to produce highly sophisticated images. The MARLIN is equipped with an asynchronous trigger shutter as well as true partial scan and integrates numerous useful and intelligent SmartFeatures for image processing. A large selection of different sensors (1/2", 1/3", 2/3") and resolutions (VGA, SVGA, XGA, SXGA) leaves no wish unfulfilled and provides the right camera for all individual applications.

- **MARLIN F-033B/C**

1/2" Sony Progressive Scan CCD; (VGA) 656 (h) x 494 (v); up to 74 fps at full resolution.

- **MARLIN F-046B/C**

1/2" Sony Progressive Scan CCD; (SVGA) 780 (h) x 582 (v); up to 53 fps.

- **MARLIN F-080B/C**

1/3" Sony Progressive Scan CCD; (XGA) 1032 (h) x 778 (v); up to 20 fps (30fps).

- **MARLIN F-131B/C**

2/3" Global Shutter CMOS; (SXGA) 1280 (h) x 1024 (v); up to 25 fps.

- **MARLIN F-145B2/C2**

1/2" Sony Progressive Scan CCD; (SXGA) 1392 (h) x 1040 (v); up to 10 fps at full resolution (15fps available on request).

The MARLIN architecture: a multitude of individual possibilities.

The MARLIN series offers the prerequisites for a camera 'on demand' through its

	MARLIN F-033B / C	MARLIN F-046B
Image Device	1/2 " (Diag 8 mm) Type progressive scan SONY IT CCD	1/2 " (Diag 8 mm) Type progressive sc
Effective Picture Elements	Raw8: 656 (H) x 494 (V); YUV: 656(H) x 492(V)	Raw8: 780 (H) x 582 (V); YUV: 780(H)
Picture Size	640 x 480 pixel (Format_0); 656 x 492 (Format_7)	640 x 480 pixel (Format_0); 780 x 58
Cell Size	9,9 µm x 9,9 µm	8,3 µm x 8,3 µm
Resolution Depth	8 Bit / 10 Bit (MARLIN F-033B)	8 Bit / 10 Bit (MARLIN F-046B)
Lens Mount	C-Mount	C-Mount
Color Modes	Raw8, YUV4:2:2, YUV4:1:1, RGB8	Raw8, YUV4:2:2, YUV4:1:1, RGB8
Digital Interface	IEEE 1394; DCAM V1.30	IEEE 1394; DCAM V1.30
Transfer Rate	100, 200, 400 Mb/s	100, 200, 400 Mb/s
Frame Rates (Mono)	3,75 Hz; 7,5 Hz; 15 Hz; 30 Hz; 60Hz; up to 74 Hz	3,75 Hz; 7,5 Hz; 15 Hz; 30 Hz; up to 5
Frame Rates (Color)- max.	74fps Raw 8 bit; 51fps YUV 4:2:2; 68fps YUV 4:1:1	53fps Raw 8 bit; 36fps YUV 4:2:2; 49fp
Image FIFO Size	17 Frames	13 Frames
Gain Control	Manual: 0-24 dB; Auto Gain; *Color-Version:* 0-24 dB	Manual: 0-24 dB; Auto Gain; *Color-Ver*
Shutter Speed	20...67.108.864µs (~67s); Auto Shutter	20...67.108.864µs (~67s); Auto Shutt
External Trigger Shutter	per Hardware and Software Asynchronous Oneshot	per Hardware and Software Asynchron
Advanced Features	Real Time Shading, Built in FIFO Memory, programmable LUT, 2 programmable Inputs/Outputs, binning, image mirror, Delayed Image Transfer, Sequencing	Real Time Shading, Built in FIFO Mem able LUT, 2 programmable Inputs/Out image mirror, Delayed Image Transfer,
Power Requirements	DC 8V – 36V via IEEE 1394 cable	DC 8V – 36V via IEEE 1394 cable
Power Consumption	Less than 3 Watt (@ 12V DC)	Less than 3 Watt (@ 12V DC)
Dimensions	58mm x 44mm x 29mm (LxWxH); w/o tripod and lens	58mm x 44mm x 29mm (LxWxH); w/o
Mass	<120 gr (without lens)	<120 gr (without lens)
Operating Temperature	+5 / - 45 ° Celsius	+5 / - 45 ° Celsius
Storage Temperature	-10 / – 60 ° Celsius	-10 / – 60 ° Celsius
Regulations	EN 55022, EN61000, EN 55024, FCC Class A, ISO 9022	EN 55022, EN61000, EN 55024, FCC Cl
Options	Removable IR-Cut-Filter (b/w), Host Adapter Card, API (FirePackage)	Removable IR-Cut-Filter (b/w), Host A API (FirePackage)

/ C	MARLIN F-080B / C	MARLIN F-131B / C	MARLIN F-145B2/C2
n SONY IT CCD	1/3 " (Diag 6 mm) Type progressive scan SONY IT CCD	2/3 " (Diag 11 mm) Type Global Shutter CMOS Sensor	1/2 " (Diag 8 mm) Type progressive scan SONY IT CCD
x 580(V)	Raw8: 1032 (H) x 778 (V); YUV: 1032 (H) x 776 (V)	1280 (H) x 1024 (V)	Raw8: 1392(H) x 1040(V); YUV: 1392(H) x 1038(V)
2 (Format_7)	1024 x 768 pixel; up to 1032 x 778 (Format_7)	Up to 1280 x 960 pixel (Format_2)	Up to 1280 x 960 pixel (Format_2)
	4,65 µm x 4,65 µm	6.7 µm x 6.7 µm	4,65 µm x 4,65 µm
	8 Bit / 10 Bit (MARLIN F-080B)	8 Bit	8 Bit / 10 Bit (MARLIN F-145B2)
	C-Mount	C-Mount	C-Mount
	Raw8, YUV4:2:2, YUV4:1:1, RGB8	Raw8; YUV4:2:2; YUV4:1:1	Raw8, YUV4:2:2, YUV4:1:1, RGB8
	IEEE 1394; DCAM V1.30	IEEE 1394; DCAM V1.30	IEEE 1394; DCAM V1.30
	100, 200, 400 Mb/s	100, 200, 400 Mb/s	100, 200, 400 Mb/s
Hz	3,75 Hz; 7,5 Hz; 15 Hz; up to 20 Hz (optional 30fps)	3,75 Hz; 7,5 Hz; 15 Hz; up to 25 Hz	3,75 Hz; 7,5 Hz; up to 10 Hz
s YUV 4:1:1	20fps Raw 8 bit; 20fps YUV 4:2:2; 20fps YUV 4:1:1 **optional 30 fps**	25fps Raw 8 bit; 12fps YUV 4:2:2; 17fps YUV 4:1:1	10fps Raw 8 bit; 10fps YUV 4:2:2; 10fps YUV 4:1:1 **optional 15 fps**
	7 Frames	4 Frames	3 Frames
on: 0-24 dB	Manual: 0-24 dB; Auto Gain; *Color-Version:* 0-24 dB	Manual: 0-10 dB; Auto Gain	Manual: 0-24 dB; Auto Gain; *Color-Version:* 0-24 dB
r	20...67.108.864µs (~67s); Auto Shutter	20µs...tbd; Auto Shutter	20...67.108.864µs (~67s); Auto Shutter
ous Oneshot	per Hardware and Software Asynchronous Oneshot	per Hardware and Software Asynchronous Oneshot	per Hardware and Software Asynchronous Oneshot
ry, programm-uts, binning, Sequencing	Real Time Shading, Built in FIFO Memory, programmable LUT, 2 programmable Inputs/Outputs, binning, image mirror, Delayed Image Transfer, Sequencing	Real Time Shading, Built in FIFO Memory, programmable LUT, 2 programmable Inputs/Outputs, High dynamic range mode, image mirror, subsampling	Real Time Shading, Built in FIFO Memory, programmable LUT, 2 programmable Inputs/Outputs, binning, image mirror, Delayed Image Transfer, Sequencing
	DC 8V – 36V via IEEE 1394 cable	DC 8V – 36V via IEEE 1394 cable	DC 8V – 36V via IEEE 1394 cable
	Less than 3 Watt (@ 12V DC)	Less than 3 Watt (@ 12V DC)	Less than 3 Watt (@ 12V DC)
ripod and lens	58mm x 44mm x 29mm (LxWxH); w/o tripod and lens	58mm x 44mm x 29mm (LxWxH); w/o tripod and lens	58mm x 44mm x 29mm (LxWxH); w/o tripod and lens
	<120 gr (without lens)	<120 gr (without lens)	<120 gr (without lens)
	+5 / - 45 ° Celsius	+5 / - 45 ° Celsius	+5 / - 45 ° Celsius
	-10 / – 60 ° Celsius	-10 / – 60 ° Celsius	-10 / – 60 ° Celsius
ss A, ISO 9022	EN 55022, EN61000, EN 55024, FCC Class A, ISO 9022	EN 55022, EN61000, EN 55024, FCC Class A, ISO 9022	EN 55022, EN61000, EN 55024, FCC Class A, ISO 9022
apter Card,	Removable IR-Cut-Filter (b/w), Host Adapter Card, API (FirePackage)	Removable IR-Cut-Filter (b/w), Host Adapter Card, API (FirePackage)	Removable IR-Cut-Filter (b/w), Host Adapter Card, API (FirePackage)

separation of the sensor and mainboard - " the design-in" and the adaptation to the required application therefore knows practically no limits. The ARM 7 microcontroller and the large FPGA (field programmable gate array) ensure the fast execution of all the camera's commands and thus results in the incredible performance of important functions - such as a perfect shading correction or a reliable white balance.
Color creation and correction takes place in the large-dimensioned FPGA, which also takes on the entire realtime control of the camera. Additionally, the MARLIN offers 64 Mbit onboard memory to successfully execute a variety of SmartFeatures such as image-FIFO, filters, color transformation, shading values and more.

The sensor.

The MARLIN camera series offers five different sensors, which all distinguish themselves with a high level of image quality and resolutions. All variants are available in b/w and color versions. The highly-sensitive CCD and CMOS sensors significantly reduce unwanted effects such as smear or blooming and offer an image quality previously unseen in this price class of FireWire cameras.

Global shutter.

When ever applications require perfect images of fast-moving objects, the global shutter function of the MARLIN will prove its worth. The capture of all pixels at the exact same time ensures unchanging, high image quality.

Asynchronous external trigger.

The MARLIN is equipped with an asynchronous external trigger, which enables instantaneous capturing without any significant latency time.

Intelligent – through SmartFeatures.

The MARLIN's numerous built-in SmartFeatures enables a variety of useful image-processing tasks on the fly, which can free up a PC that buffers image processes.

Lookup table.

The programmable lookup table (LUT) in the internal memory of the MARLIN can

be switched into the signal routes as needed. The LUT can be created with a PC (for example with a program such as Excel™) and then be loaded effortlessly into the camera. The advantages of the MARLIN's integrated lookup table become especially apparent during complex image processing tasks, such as the creation of non-linear characteristic lines, to emphasize different image level areas (gamma LUT) or threshold operations.

Realtime shading correction.

A further SmartFeature of the MARLIN is realtime shading correction, which can bring any image point to a normal level via a corrective matrix, to compensate for local lighting or objective errors for example.

Intelligent color processing.

The color versions of the MARLIN series offer an extremely good and balanced color display, as a result of a well-thought-out color correction matrix. The MARLIN takes care of the Bayer demosaicing and the color conversion from RGB to YUV in the FPGA. The color display thus becomes more natural and individual color tones can be displayed or distinguished.

Image memory - FIFO.

A MARLIN camera can store up to 17 full-resolution images (F-080: 7 images, F-131: 4 images, F-145: 3 images) in its image FIFO at a maximum image rate and can thus relieve a PC's image capturing and the related waiting times to a large extent. This smart camera can also take pictures whilst the PC is still processing the previous images.

Sequencing.

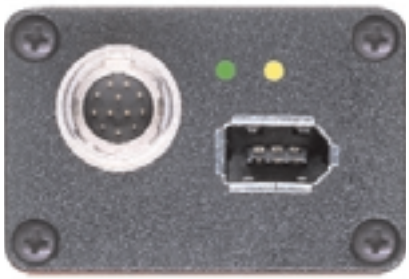
When capturing in sequencing mode (not MARLIN F-131), every image can have specific parameters applied to it – such as gain, offset, image cutout and LUT. The parameters are thereby updated in the camera itself, from one image to the next.

Programmable I/O.

Apart from its simple operation, the MARLIN offers a series of well-thought-out trigger functions. For the hardware end of the connection to the process, two inputs and two outputs are available. Apart from the external trigger, image capturing via signal connection (e.g. Gate and trigger) is also possible.

Software.

Image processing with the MARLIN follows the Plug&Play principle: the Allied Vision Technologies software supports still image (WIA/TWAIN) and video stream (video capture and preview) as well as the integration of the camera over its own API. Digital cameras are as easy to use for image processing today as analog cameras and frame-grabbers, but naturally offer better images and higher speed. The prerequisites for the simplest integration are established with AVT's software. The MARLIN family is compatible with all current image processing packages, such as National Instruments Labview, MVTec Halcon, MVTec Active Vision Tools, Stemmer Imaging Common Vision Blox and Matrox Inspector – all of which support the FireWire standard.



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